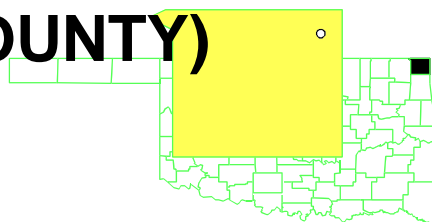


TAR CREEK (OTTAWA COUNTY) OKLAHOMA

EPA ID# OKD980629844

EPA REGION 6
CONGRESSIONAL DISTRICT 02
Ottawa County

Updated: 8/2/00



Site Description

Location: ! Oklahoma portion of Tri-state mining district which includes northeastern Oklahoma, southeastern Kansas, and southwestern Missouri.
! Old Picher Field lead and zinc mining area, consisting of northern Ottawa County, Oklahoma.

Population: ! Approximately 30,000 in area.

Setting: ! The site encompasses the towns of Miami, North Miami, Picher, Cardin, Quapaw and Commerce, Oklahoma. Approximately one-half of the land in the mining area is Indian owned.

Hydrology: ! Contamination was in the Boone formation with great potential for lateral migration through an extensive series of mine workings.
! Roubidoux formation is the drinking water aquifer under Cotter and Jefferson City formations at about 1100 feet below surface.

Wastes and Volumes

Principal Pollutants in Water:

Volume:

<u>Contaminant</u>	<u>Level</u>
pH	3.6-5.7
Lead	80 ug/L
Zinc	331,000 ug/L
Cadmium	80 ug/L

! Approximately 76,000 acre-feet of contaminated water.

(ug/L = micrograms per liter)

Principal Pollutants in "Chat" (mine tailings):

Volume:

Lead	750 mg/kg
Cadmium	46 mg/kg
Zinc	8,300 mg/kg

Approximately 48 million cubic yards

(mg/kg = milligrams per kilogram)

Principal Pollutants in Settling Ponds (mine tailings)

Area:

Lead	3,800 mg/kg
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Approximately 800 acres

Cadmium 124 mg/kg
Zinc 21,600 mg/kg

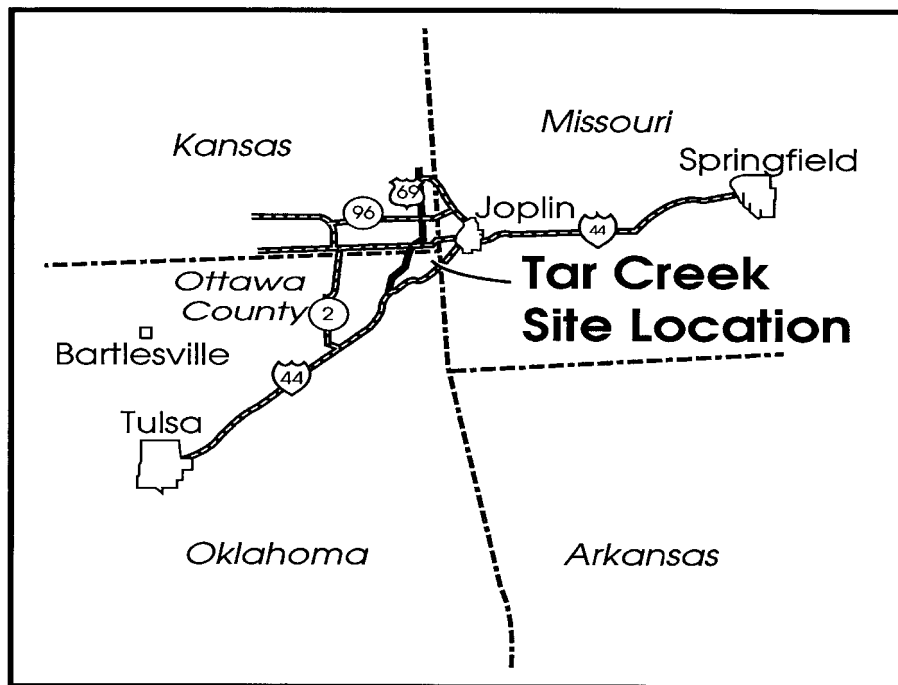
Site Assessment and Ranking

NPL LISTING HISTORY

Site HRS Score: 58.15
Proposed Date: 7/27/81
Final Date: 9/08/83
NPL Update: No. 1

Site Map and Diagram

View site photos at the link at the bottom of the “Superfund Site Status Summaries for Oklahoma” web page (<http://www.epa.gov/earth1r6/6sf/6sf-ok.htm>).



The Remediation Process

Site History:

- ! Major lead/zinc mining area from early 1900s-1960s.
- ! A few small operators continued mining until early 1970s.
- ! When the major mining ceased in the 1960s, the dewatering activities also ceased and the mines began filling with ground water.
- ! Highly acidic mine water containing high concentration of heavy metals began discharging into Tar Creek in 1979 from natural springs, bore holes, and abandoned mine shafts.
- ! A remedial investigation was conducted in 1982 and 1983 resulting in a Record of Decision (ROD) in June 1984.
- ! Roubidoux aquifer monitoring report completed 12/93.
- ! August - October 1985, an emergency water supply for the City of Picher was put in place by the National Guard. EPA plugged the contaminated well, drilled a new well and flushed city lines. Water quality returned to normal; National Guard discontinued water delivery.
- ! December 1986, construction of the ROD remedy was completed.
- ! April 1994, a Five Year Review of the remedy was issued. New studies to evaluate mining waste, not addressed in the original remedy, as a source of contamination began in Fall 1994.
- ! Iron levels in drinking water from 5 community wells in the mining area are elevated above secondary standards. The Oklahoma Department of Environmental Quality (ODEQ) is investigating to determine if the Roubidoux Aquifer is the source of the contamination.
- ! A summary of results of Indian Health Service testing made available to EPA in 1994 indicated that approximately 35% of the Indian children tested in the area had blood lead levels greater than 10 ug/dL, the level that is considered elevated.
- ! EPA investigated 28 high access areas (day cares, schools, parks, and similar areas where children tend to congregate) in Fall 1994 for mining waste contamination.
- ! Ten of the 28 high access areas (HAA) were targeted for removal actions.
- ! The Oklahoma Department of Health completed the screening of children in the mining area for blood lead poisoning in October 1995. In the Picher-Cardin area, the heart of the mining area, 21 percent of the children had elevated blood lead levels.
- ! Remedial investigation and feasibility study (RI/FS) work plans for the mining waste were completed by the Army Corps of Engineers in July 1995.
- ! EPA completed sampling soil at approximately 2,000 residences in the mining area for lead and cadmium contamination in August 1995.
- ! The PRPs were issued Special Notice for the residential RI/FS and remedial design (RD) in November 1995, but they declined to conduct or finance the work.
- ! The Corps of Engineers awarded a delivery order on April 17, 1996, to its contractor to perform the residential area RI/FS.
- ! The Corps of Engineers awarded a delivery order on May 1, 1996, to its contractor to perform the removal action which will be completed Summer 1997.
- ! EPA has completed the RI/FS for the residential areas and has issued the following reports: Data Evaluation Summary Report, August, 1997; Baseline Human Health Risk Assessment of Residential Exposures, August 1996; Preliminary Remediation Goals, Residential Exposures, September, 1996; Residential Remedial Investigation Report, January, 1997; and Residential Feasibility Study Report, February, 1997.

Health Considerations:

! The lower aquifer serves several towns and rural communities in Ottawa County and is threatened due to several bore holes and leaking abandoned wells connecting the aquifer. Eighty-three of these bore holes were plugged in 1986 to prevent migration to the Roubidoux.

! Current public water supply monitoring indicates that primary drinking water standards are not being exceeded in the Tar Creek area.

Other Environmental Risks:

! High concentrations of heavy metals have been discharged to the surface water. The shallow Boone Formation aquifer has been contaminated with heavy metals.

! Lead contamination in surface soils is a source of exposure to children living in the area.

Record of Decision

OU1 Signed: June 6, 1984 OU2 Signed: August 27, 1997

! The Operable unit 1 (OU1) record of decision (ROD) was issued June 6, 1984 and addressed surface water in Tar Creek and ground water.

! The OU1 remedy included the following:

- Diversion and diking of two major inflow areas in Kansas and one potential inflow area in Oklahoma
- Plugging 83 identified abandoned wells in the Roubidoux aquifer, and any other abandoned wells found connecting the Roubidoux
- Monitoring program to monitor contamination of the Roubidoux aquifer and Tar Creek

! The OU2 ROD was issued August 27, 1997 and addressed contaminated soil in the residential areas.

! The OU2 remedy included the following:

- Excavation of lead-contaminated soil above 500 mg/kg and replacement with clean soil at approximately 1,300 residential properties
- Disposal of excavated soils on-site in existing mining waste areas
- Institutional controls (e.g., health education, indoor dust reduction, and blood lead monitoring)
- Covering or replacement of chat surfacing on traffic areas with road base material (e.g., gravel or crushed limestone)
- Physical barriers (e.g., fences and warning signs) to restrict access to mining waste areas
- Establishment and improvement of ground cover for residential yards outside the mining area

Community Involvement

! The Oklahoma Department of Environmental Quality (ODEQ) has the lead on community outreach.

! Open Houses and Workshops: 12/86, 4/94, 8/94, 1/95, 5/95, 9/95, 1/96, 6/96, 2/97, 10/97

! Public Meetings: 2/9/84 and 3/27/97

! Proposed Plans: 2/84 and 3/97

! ROD Press Release (EPA): 6/84, 8/97

! Milestone Fact Sheets/Press Releases: 6/82, 12/82, 1/84, 7/84, 10/84, 11/85, 12/86, 3/94, 5/95, 9/95, 6/96, 2/97, 9/97, 6/98

! Citizens on site mailing list: 20

! Site Repository: Miami Public Library, 200 North Main Street, Miami, OK 74354

Technical Assistance Grant

! Availability Notice: July 24, 2000

! Letters of Intent Received: First LOI

August 26, 1999

Lee Subdivision Homeowners Association.

Sam Finigan

233 Franlee, Houston, TX.

Final Application was rejected

Second LOI

May 3, 2000

RESPECT Committee

Bebe Lising

2733 Third Avenue

Houston, TX

! Grant Award: None

! Current Status: TAG application deadline is July 27, 2000

Fiscal and Program Management

U.S. Environmental Protection Agency

! **Remedial Project Manager (Residential):** Philip Allen, P.E., 214-665-8516* (Mail Sta. 6SF-AP)

E-Mail Address - allen.philip@epa.gov

! **Remedial Project Manager (Nonresidential):** Rafael A. Casanova, 214-665-7437* (Mail Sta. 6SF-AP)

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! **Region 6 Ombudsman:** Arnold Ondarza, 214-665-6790* (Mail Sta. 6SF)

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! **Community Involvement:** Donn Walters, 214-665-6483* (Mail Sta. 6SF-AP)

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! **Attorney:** Jim Costello, 214-665-8045* (Mail Sta. 6SF-DL)

E-Mail Address - costello.james@epa.gov

! **State Coordinator:** Roberta Hirt, 214-665-8079* (Mail Sta. 6SF-AP)

E-Mail Address - hirt.roberta@epa.gov

! ***Toll-Free Number:** 1-800-533-3508

Oklahoma Department of Environmental Quality

! **Environmental Specialist Supervisor:** Monty Elder, 405-702-6100

Quapaw Tribe

! **Environmental Program Director:** Earl Hatley, 918-542-1853

Prime Contractors

- ! **After Action Monitoring:** Oklahoma Department of Environmental Quality
- ! **Removal Activities:** EPA Technical Assistance Team
- ! **Mining Waste RI/FS:** U.S. Army Corps of Engineers

Enforcement

- ! Cost recovery after completion of RD/RA.
- ! Consent Decree entered June 10, 1991 - United States District Court Northern District of Oklahoma
- ! EPA settled with the Potentially Responsible Parties (six companies that formerly mined the site).
- ! Amount recovered pursuant to Consent Decree: \$1,273,000.00, check dated June 19, 1991.
- ! Payment reimbursed Government for cost incurred in connection with the RI/FS, the ROD, and Emergency Response involving the Picher Municipal Well.

Present Status and Issues

- ! A Phase II Ground Water Monitoring project is being conducted by ODEQ. The purpose of the monitoring is to determine the source of contamination in the 5 community wells that do not meet secondary drinking water standards.
- ! Approximately 50 per cent of the land in the Oklahoma portion of the mining district is owned by the Quapaw tribe. Remedial actions on these lands are not subject to the cost share provisions of Superfund.
- ! In addition to the parties (companies that formerly mined at the Site) that settled with EPA in 1991, the U.S. Department of the Interior may be a responsible party at Tar Creek. Discussion with mining companies are ongoing.
- ! An Action Memorandum to address the HAAs was signed on August 15, 1995. The soil removal work began September 15, 1995 and is scheduled for completion in January 1998.
- ! The HAA removal consists of the excavation and disposal of soil from HAAs contaminated with lead and cadmium. The disposal area is located on-site in a mill tailings pond. The removal action/cleanup levels are 500 parts per million (ppm) lead and 100 ppm cadmium.
- ! An Action Memorandum to address high concentration soils in residential yards was signed on March 21, 1996. The trigger level that targets yards for cleanup is 1500 ppm lead and the cleanup level is 500 ppm lead. Also yards of children with elevated blood lead levels will be cleaned up if the soil lead levels are equal or greater than 500 ppm.
- ! The Corps of Engineers began residential soil removal work on June 24, 1996.
- ! Through December 1997, approximately 275 residential yards were cleaned up under the removal action.
- ! Field work for the Phase II Ground Water Monitoring Program began August 1996 and is scheduled for completion in 1999.
- ! Preliminary findings of the monitoring program indicate that the Roubidoux Aquifer (the deep aquifer in the area) is still a good source of drinking water provided the wells producing from the Roubidoux are properly cased through the old mine workings.
- ! A new Roubidoux monitoring well in Picher, installed in 1997, is producing 300 gallons per minute of good quality water based on preliminary testing; which is further evidence that the Roubidoux is still a good source of drinking water.
- ! Remedial action field work to address residential properties under the 1997 Record of Decision, in addition to the 275 residences addressed by the removal action, began January 1998. A total of approximately 2100 properties in both the removal and remedial phases have been identified for remediation. Through March 2000, approximately 1400 properties have been cleaned up under both the removal and the remedial action.
- ! The main component of the remedial action for the residential areas (OU2) is excavation and

replacement of lead contaminated surface soil.

! Non-residential areas in Cardin, Oklahoma: As a pilot project to enhance Tribal involvement in the Superfund program, EPA is funding the Quapaw Tribe and ITEC to conduct an RI/FS for two industrial properties located in Cardin, Oklahoma. The two properties being studied for remediation are the former Eagle-Picher complex northeast of the intersection of First St. and Elm St. and the former Childress Chemical Company facility located southwest of the intersection of First St. and Elm St. Both properties are impacted by chat and other mining related waste. Initial funding for the Tribal pilot was provided in September 1998.

! Non-residential investigation for Beaver Creek: In January 1999, EPA funded the Quapaw Tribe and ITEC to conduct an RI/FS for the Beaver Creek watershed. Beaver Creek flows through the Quapaw power grounds before entering Spring River. The impacts of mining waste located at the Quapaw Waste site and other areas in the Beaver Creek watershed will be investigated.

! Non-residential Investigation by ODEQ: Planning by ODEQ for an RI/FS to address impacts and problems associated with the chat piles and tailings ponds was funded by EPA in January 1999.

Benefits

! Actions by the State of Oklahoma and the EPA have reduced the potential for contaminants in the shallow ground water to migrate to deeper drinking water aquifers and have achieved the ground water cleanup standards established for the site.

! The State also has completed cleanup activities at the Tar Creek (Ottawa County) site for surface water improvement.

! Several miles of stream diversion reduces inflow to mines.

! Cleaning up the contaminated residential soil is expected to significantly reduce exposure of the population in the local communities to lead.